

## CLAIMS

1. Hydrokinetic coupling apparatus (1) in particular for a motor vehicle, having a casing <sup>18,24</sup>(30) provided with a transverse wall <sup>19</sup>(3), able to be fixed with respect to rotation to a driving shaft, a turbine wheel <sup>27</sup>(12) housed inside the casing (30) and fixed to a hub <sup>32</sup>(14), able to be fixed with respect to rotation to a driven shaft, a first surface (1) fixed to the transverse wall (3) of the casing (30), a lock-up clutch acting between the said turbine wheel (12) and the said transverse wall (3) and comprising a piston <sup>36</sup>(4) carrying a second surface (2) extending opposite the first surface (1) for its disengageable connection to the transverse wall, characterised in that the piston (4) is connected by axially <sup>42</sup>elastic tongues (23) to the external periphery of the casing (30).

2. Apparatus according to Claim 1, characterised in that the tongues (23) are tangentially oriented.

3. Apparatus according to Claim 1, characterised in that the tongues (23) are radially oriented.

4. Apparatus according to any one of Claims 1 to 3, characterised in that the tongues (23) are circumferentially distributed in several sets of tongues (23) each including at least one tongue.

5. Apparatus according to any one of Claims 1 to 4, characterised in that the tongues (23) extend radially above the second surface (2).

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6. Apparatus according to any one of Claims 1 to 4, characterised in that the tongues (23) extend opposite the second surface (2).

7. Apparatus according to any one of Claims 1 to 4 and 6, characterised in that the casing (30) has casing elements (7, 8 - 3, 6) each provided at their external periphery with an axially oriented annular flange (7, 6) and in that the tongues (28) are connected to one of the flanges (6, 7).

8. Apparatus according to any one of Claims 1 to 5, characterised in that the tongues (23) are fixed to the piston (4) and to the transverse wall (3).

9. Apparatus according to Claim 7, characterised in that the tongues (23) act between a first piece (24) fixed to the piston (4) and a second piece (25) fixed to one of the flanges (6, 7).

10. Apparatus according to Claim 9, characterised in that the first piece is in a single piece with the piston (9) and consists of lugs or a transverse flange.

11. Apparatus according to Claim 9, characterised in that the first piece (24) is distinct from the piston (24) while being fixed thereto, for example by welding, adhesive bonding or crimping.

12. Apparatus according to Claim 11, characterised in that, for fixing the first piece (24), the piston (4) has at its external periphery an axially oriented annular skirt (27) extending in the opposite direction to the transverse wall (3).

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13. Apparatus according to Claim 12, characterised in that the first piece (24) is flat and has at its external periphery lugs (44) each engaged in a notch (46) provided in the free end of the skirt (27).

14. Apparatus according to any one of Claims 9 to 13, characterised in that the second piece (25) is distinct from the flange (6, 7) and has transverse lugs (53) provided in the free end of the relevant flange (6, 7).

15. Apparatus according to Claim 13 and Claim 14, characterised in that the lugs (53, 44) on the second (25) and first (24) pieces are fixed respectively to the flange (6, 7) and to the skirt (27) of the piston.

16. Apparatus according to Claim 14, characterised in that the fixing is effected by crimping, the lateral edges of the notches (45, 46) being crushed.

17. Apparatus according to Claim 15 or 16, characterised in that the second piece has the shape of an angle bracket and has a transversely oriented part to which the tongues (23) are fixed and an axially oriented part having the transverse lugs (53) at its external periphery.

18. Apparatus according to Claim 8, characterised in that the tongues (23) are fixed to pieces (25) in the form of stepped tongues each with a bracket for fixing a set of tongues, and in that the pieces are fixed to the external periphery of the transverse wall. 43, 44

19. Apparatus according to Claim 8, characterised in that the pieces (25) are distinct from the tongues (23). 43, 44

20. Apparatus according to Claim 19, characterised in that the pieces are in a single piece with the tongues.

21. Apparatus according to any one of Claims 7 to 20, characterised in that the tongues are fixed by riveting.

22. Apparatus according to any one of Claims 1 to 21, characterised in that the hub (14) has an axially oriented annular part (16) directed towards the transverse wall and in that the piston (4) surrounds the said axially oriented annular part (16) of the hub (14) with annular clearance.

23. Apparatus according to any one of Claims 1 to 22, characterised in that the torsion damper (28) is interposed between the piston (4) and the transverse wall (3) in order to filter the vibrations, the said damper acting disengageably between the piston (4) and the hub (14).

24. Apparatus according to any one of Claims 1 to 23, characterised in that the torsion damper has two guide washers (36, 37) disposed on each side of the damper plate (35) connected with respect to rotation, possibly with take up of clearance, with the hub (14), in that a disc (31) is fixed to the guide washers (36, 37) and in that the disc (31) is intended to be clamped between the first and second surface (1, 2).

25. Apparatus according to Claim 23 or 24, characterised in that the disc (31) carries on each of its faces a friction lining (33) and in that the linings (33) are intended to be clamped between the surfaces (1, 2).

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26. Apparatus according to Claim 24 or 25, characterised in that the disc (31) is fixed to flanges pressed against each other (55, 155) which the guide washers (36, 37) have at their external periphery.

27. Apparatus according to any one of Claims 1 to 26, characterised in that the hub (14) has an axially oriented annular part (16) with a surface (20) surrounded by a ferrule (22) which the piston has at its internal periphery and in that the surface (20) is extended in the direction of the transverse wall by flutes (19) for a rotational connection, possibly with the taking up of a circumferential clearance, of a hub (35) on the torsion damper (28).

28. Apparatus according to any one of Claims 1 to 27, characterised in that a friction means (60) acts between a transverse surface (15) of the hub (14) and the piston (4) and in that the piston (4) is shaped so as to carry the friction means (60), and in that the hub (14) has an axially oriented annular portion (16) directed towards the transverse wall (3) and surrounded by the piston (4) mounted so as to be able to move axially with respect to the said portion.

29. Apparatus according to Claim 28, characterised in that one of the elements consisting of friction means (60) and piston (4), has at least one projection (61, 166, ...) engaged in a complementary manner in a hole (62, 66, ...) in the other one of the elements consisting of piston (4) and friction means (60).

30. Apparatus according to any one of Claims 1 to 29, characterised in that the turbine wheel (12) has an annulus (13), possibly divided, fixed to the hub (14) by means of a

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*as cont* rivet (59), in that a friction means (60) acts between the hub (14) and the piston (4) and in that the friction means (60) is carried by at least one rivet (59).

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